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A description is presented of the first phase of the Florida Schoolhouse Systems Project. Following a presentation of the background and objectives of the SSP, the development of integrated building systems is considered with regard to--(1) stimulation of research and development, (2) performance specifications and competitive bidding, and (3) roles of contractors, labor, architects and engineers. An evaluation is presented of the quality, design freedom, costs, and construction time of School Construction Systems Development schools in four states. Recommendations are made for the SSP concerning-- (1) use of existing components for single schools and for a volume buying program, (2) time schedule of the research and development program, (3) legal authority, (4) staff, and (5) financing. (FS)

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FIRST PHASE REPORT

FLORIDA SCHOOLHOUSE SYSTEMS PROJECT

SPONSORED

BY

FLORIDA STATE BOARD OF EDUCATION

AND

EDUCATIONAL FACILITIES LABORATORIES, INC.

FLOYD T. CHRISTIAN

STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

TALLAHASSEE, FLORIDA

JUNE, 1967

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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ACKNOWLEDGMENTS

Dr. James T. Campbell, Assistant Superintendent, Division of School Administration, urged the beginning of investigations of the California School Construction Systems Development Project (SCSD), which led up to the initiation of a Florida project. Dr. C. E. Chick, Executive Director, Division of School Administration, helped with organization, and the clearing of obstacles along the path of progress. Architect Wayne F. Betts, Acting Director, School Plant Planning, assisted with investigation prior to the beginning of a project. School plant planners from the school districts interested in a Florida project, along with Dr. Chick and Mr. Betts, formed an advisory committee to the Florida SCHOOLHOUSE SYSTEMS PROJECT (SSP) staff. This committee has met regularly with the staff.

Educational Facilities Laboratories, Inc. (EFL), and its subsidiary, the School Planning Laboratory (SPL) at Stanford University contributed greatly to the project. Mr. John Boice, Coordinator of the SCSD project, has been an invaluable source of information and has given much time and assistance to the Florida project. Members of the Florida staff have met with him at Stanford on three occasions and he has made three trips to Florida. Architects Ezra Ehrenkrantz and Vernon C. Bryant, Jr., have also made significant contributions. Dr. Harold Gores, President of Educational Facilties Laboratories, and Mr. Jonathan King, Vice President-Treasurer, have given advice and encouragement and provided EFL funds for expenses of conference consultants. EFL is sharing, with the State of Florida, the cost of administering the first nine months phase of the project.

The following architectural firms gave of their time to discuss their experiences with SCSD and to show their schools:

Cone and Dornbusch, Architects
100 North La Salle Street
Chicago, Illinois

Duffy and Dreher, Architects
3401 Colorado Street
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Heery and Heery
Architects and Engineers
1705 Commerce Drive, N. W.
Atlanta, Georgia

Dr. Robert Finley, Superintendent, Barrington, Illinois, and Dr. Clayton Farnsworth, Principal, Southern Nevada Area Vocational Technical School, gave their own time and that of their staff members to explain the exciting programs in operation in their SCSD schools.

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I. INTRODUCTION

Background of Florida Project

England and other European countries faced a tremendous backlog of building needs after World War II. Inactivity during the previous seven years of war, loss caused by the war, and the failure of skilled construction workers to return to the industry from wartime occupations all added together to compound the problem. In Great Britian, construction of elementary schools was taking up to three years. Something was needed to reduce construction time and in-field labor cost. Integrated structural building systems resulted and were much used, especially in school construction.

During the early postwar period, Ezra Ehrenkrantz, an architect from the United States, spent two years working in England with one of the systems groups. He returned to join the staff of the University of California at Berkeley. Because of the shortage of schools in this country and a desire to build both higher quality and more economical schools, the School Planning Laboratory at Stanford University and Educational Facilities Laboratories (EFL), became interested in the possibilities offered by building systems. In January, 1962, the first meeting of the advisory committee for School Construction Systems Development (SCSD) was held at Stanford. Members included leading architects and educators from across the country.

Part of the California SCSD schools were opened for use in September, 1966, and the last school in the project was bid in January, 1967. Evaluation of the project is underway, with plans to disband the staff at Stanford in the near future. The entire administrative cost of the project was financed by EFL.

The Florida project will be referred to as the Florida SCHOOLHOUSE SYSTEMS PROJECT (SSP). Stanford University holds the right to use of the name "School Construction Systems Development."

Periodic reports of the SCSD project have appeared since 1962. In 1965, personnel from the Florida State Department of Education began an investigation of SCSD, but at that time none of the schools in California were completed. On November 29, 1965, a statewide seminar was held in Miami with a program of six out-of-state consultants telling of their experience with SCSD. During early 1966, school plant planners from six counties, and State Department of Education officials met a number of times to make basic decisions concerning what to do about component systems development in Florida.

On September 24, 1966, the State Board of Education approved a recommendation by the Superintendent for the first phase of a Florida project which was to produce the following results:

> Complete evaluation of previous experience with school construction systems in England, California and elsewhere.
>
> Determine interest and support from school districts, industry, and others for a Florida project.
>
> Determine the applicability of systems to different types of school buildings and school centers.
>
> Outline procedures for organizing and initiating a project.
>
> Develop an estimate of the cost of administering a project and recommendations for financing.

The cost of operation of the first phase of the Florida SSP from October 24, 1966, through June 30, 1967, is shared equally by the State of Florida and Educational Facilities Laboratories.

Objectives

Objectives set at the beginning of the SSP are the same, in general, to those adopted at the beginning of the SCSD project:

1. To build better schools
2. To build them more economically
3. To build them more rapidly

"Better schools" refers to buildings, better both educationally and architecturally. Economy involves consideration of both first cost and long term cost, including the cost of remodeling which will be needed to provide for future program changes and also day to day operating costs.

The SCSD project was conceived as a way to attack the status quo of the school construction field by:

1. Developing new products designed specifically for schools

2. Encouraging manufacturers to work together so that their products would constitute an integrated system

3. Guaranteeing a sufficiently large market to encourage manufacturers to expend research and development funds

Need for Changeable Facilities

Society and education are changing and at an increasing rate. The most important task for those writing educational specifications for new facilities may be to identify possible future changes of instructional programs which will require modifications of facilities. Predictions in education into the future are difficult and this places a greater importance on the need for facilities which can be changed easily and economically. The buildings must be designed to get out of the way of the programs.

II. DEVELOPING INTEGRATED BUILDING SYSTEMS

Stimulation of Research and Development

Much of modern industry's advance can be directly charged to research and development, and all major members of industry are constantly involved with some research and development, depending upon various outside stimuli. The aerospace industry, for example, has made tremendous progress in a few short years with the skillful application of the products of research, so much so that the resultant effects have spread across many segments of our economy.

In the construction industry, there is little or no comparable connection between researchers and those who apply the results of research. This condition has limited the construction industry's advance, when compared to the aerospace industry, electronics industry, and others, particularly in regard to school construction. What must be done to gain a greater advantage from the available, but untapped, potential in this field of building construction? The building industry must be challenged to coordinate a program of research, development, design, manufacturing, marketing and construction.

For years there has been a series of good, but unrelated, construction parts available. These parts are designed to perform their own specific function with, generally, no thought given to their relationship to associated building elements. A true building system is needed which can be defined as a series of independent parts that are joined through a carefully integrated program to act as an entity. Building components in a systems must be related to other components, and some non-systems parts, both functionally and dimensionally, so that together they will function as one compatible system.

Stimulation is needed to generate action. Other types of construction such as large hotels or office buildings provide single projects large enough to encourage industrial research and development. School construction makes up one of the largest building markets but bids are usually taken on individual building projects of a few million dollars, or less. In order to provide a market of sufficient size, Florida school districts must join to pool projects, stimulating industry to develop integrated building systems for meeting the unique needs of Florida.

Performance Specifications and Competitive Bidding

The present and future educational needs, as related to the building program, may be identified in broad educational specifications, prepared jointly with the member school districts and the project staff. Other conditions and needs must also be determined and all requirements utilized to prepare performance specifications which describe what the products should do. This differs from the normally used product specifications. Products which meet the demand of performance specifications may or may not exist on the market, but any industrial group could make preparations to meet the requirements and submit bids to furnish a product. This is not true with product specifications where, generally, a product is described and others may be noted as equal. Bidding is limited to a few manufacturers and no challenge is offered industry to develop new and improved products. Product specifications limit the imagination, research, development, design, manufacturing and marketing in the construction industry and the purchaser suffers the loss. In the case of schools, the losers are the learners, the teachers and the taxpayers.*

Following the completion of educational specifications, performance specifications may be written for those systems to be integrated as a part of the program. In the SCSD project this included structure, ceiling, lighting, partitioning, the environmental control (heating and cooling), casework and locker systems. Performance specifications will then be issued to the various members of industry who have indicated an interest in the program.

Industry will review the performance specifications, do research and development, and at a specified time present their proposals to the SSP staff for evaluation. Submission of proposals and evaluation will occur as often as is necessary to assure the maximum development, and when this has been completed the staff will call for competitive bids. The project staff will assemble these bids, coordinate them into the most compatible groupings, determine which grouping is in the best interest of the program, is the most economical, and nominate successful bidders.

When the successful bidders have been nominated, details of the successful system will be furnished to the architects and engineers commissioned to design the several projects of the member school districts. The project staff will assist in coordination between the component suppliers and the architects/engineers during the design phase, contract award phase and the construction phase of the project schools.

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*The purpose of the SSP program is to stimulate as much competition as possible, rather than restrict competition to a certain material or approach to solving a building problem.

Roles of Contractors, Labor, Architects and Engineers

The work of the general contractors, in assembling costs to submit their bids, is the same as their normal procedures except that the component manufacturers have competitively pre-established their prices to the project staff at the time of nomination of the successful bidders. Responsibility for the coordination of the total work by the general contractors remains the same as usual. The component supplier fills the role of a normal sub-contractor with an assigned pre-bid. The general contractor's profit structure remains the same as usual.

In general, labor's relationship to a project of this sort is the same as it would be if the school district's architect developed his own system design without the knowledge of the existence of SSP. It has generally been the practice, where systems schools have been built, to employ local labor to install the systems products. However, coordination with the participating labor unions is vital to the successful operation of the project.

The role of architects and engineers is substantially unchanged. Architects may re-allocate their time, after they have learned to handle the systems, to put more effort in learning and understanding the educational needs and interpreting them into design. The structure must be engineered to the requirements of the particular site and the exposure to hurricane winds; air conditioning engineered for particular exposures, amount of exterior windows, and number of people occupying the area; electrical requirements planned for the utilities, equipment and lighting requirements; sanitary system engineered for space and occupancy of area; and numerous other details planned for the individual needs of a particular project. Professional services are needed on systems projects as on any other, and school boards should retain people who give the best services. A system of components is not a building and the services of the individual school architect and his consultants is in no way eliminated or minimized.

III. EVALUATION OF EXISTING SYSTEMS

Visitations

The SSP team visited ten completed and operating SCSD schools in California, Nevada, Illinois and Georgia, four under construction in California, and talked with members of five architectural firms who have planned SCSD schools. They also visited the Lockheed Aircraft Engineering-Office Building (300,000 sq. ft.) in Marietta, Georgia. Buildings were visited which were constructed with products supplied by the SCSD successful bidders, SCSD unsuccessful bidders, and by companies who did not bid in the California project but who have developed products similar to those which were successful.

Quality

At least one school, of recent construction, was visited in each of the Florida school districts interested in the project, as well as a number of junior college campuses, to gain a general impression of the quality of current construction in Florida. It is the opinion of the SSP team that the general quality of component systems schools is superior to 70 to 80 percent of the current construction in Florida.

Few, if any, school buildings have been built in Florida which have comparable flexibility. A significant number of Florida districts have schools with movable (folding) partitions and many have buildings with non-load bearing partitions. The space is not really flexible, however, because when partitions are re-arranged air conditioning controls, supply and return, and lighting supply and controls are not sufficiently adaptable to properly condition the newly created space. Walls which must be torn down resist change far out of proportion to the cost of the change. The SCSD systems provide an integrated flexible partition, air conditioning, and lighting system which can be equalled only with very careful planning and high cost.

Few demountable partitions have been moved in systems schools visited. In Bertha Ronzone Elementary, Las Vegas, Nevada, two sides of two classrooms were moved at the beginning of the second year of school in September, 1967. Two custodians, without special training, and using only a hand tool to "snap out" the 40" panels, moved the partitions in about two hours on a weekend. Dr. Robert Finley, Superintendent, Barrington, Illinois, declared that this summer, after only one and a half years of use, about one third of the demountable partitions in the 1200 pupil Middle School will be moved.

Lighting quality was excellent throughout all the buildings visited. The performance specifications required low brightness, low contrast lighting with a minimum of 70 foot candles for normal reading tasks. Readings were taken in the buildings visited and the minimum noted was 100 foot candles. Readings included those taken in classrooms in Bertha Ronzone Elementary, which was the first school completed with products developed for the SCSD program. After one and a half years of use, in which there is always some deterioration from the collection of dust on fixtures, a uniform reading of 100 foot candles on the task surface was noted.

Systems air conditioning apparently is satisfactory in all installations. John Boice and Vernon C. Bryant, Jr., of the SCSD project staff noted that the roof mounted system was selected after extensive evaluation of performance, cost and flexibility of the system. Performance specifications required that suppliers provide a price including five years of maintenance and that the school district could choose to purchase air conditioning with or without the maintenance contract.

Extensive performance tests were taken in the SCSD prototype building over a period of time and with varying conditions. Temperatures and air velocity, lighting quality and quantity and sound intensity and reduction were recorded. Performance specifications required that all products developed for the building systems be field tested together as a system.

Planning for the SCSD schools was of exceptionally high quality. Member districts agreed to prepare educational specifications. The functional quality, as related to educational programs, was particularly good.

In general, the aesthetic quality of the schools was excellent, although it varied as in the use of any other building components, with the talent and sensitivity of the architect, the demands and appreciation of the client and the budget. The budget probably was less influential than the first two because buildings of similar cost designed by different architectural firms were quite different in their appeal to the visual senses. Interior quality was particularly impressive, creating pleasant and exciting environments with systems walls, lighting and ceiling an important part. Exteriors varied as did interiors, from good to excellent, although evaluation is made difficult by the fact that schools were often to be built in stages, and landscaping was usually not started, unfinished or immature.

Systems partitions are virtually maintenance free. They are a gypsum board with steel facing on both sides which can have a variety of finishes.

Design Freedom

Architects and engineers have the same freedom afforded by any system or group of products selected. All firms who had used the SCSD systems said they would repeat the use, and a number of them have. They view the systems as additional tools with which to design rather than as restrictions. The problem of rejection by architects and engineers is consistently caused by lack of a thorough enough inquiry into the systems, and fear of the unknown.

Plans of schools visited varied from compact, completely enclosed, single unit buildings, to total campus plans. The systems products were used successfully for elementaries, a middle school and high schools.

Interiors varied from open plans without corridors, classroom doors, complete walls, or enclosed spaces, to buildings of essentially the conventional self-contained classrooms enclosed by demountable systems partitions and doors with capability of reducing sound transmission by 32 decibels.

Exteriors and interiors varied from the unexciting to pleasant, colorful and exciting. The use of color, materials, art work and detail was open to the talents and sensitivity of the architect. None of the exterior materials was a part of the component systems.

Costs

In the California project, costs for the systems schools were similar to costs of conventionally built schools located in the same general geographic areas and built in the same time periods. Costs of all buildings compared were computed by the formula used to determine State Aid allowances which make them as comparable as is possible. California's State Aid program considers pupil capacity, limits gross square feet per occupant, fixes an allowable square foot expenditure for different construction market areas in the state, provides a formula for computing square feet of building and identifies the elements which are included in the cost amount. One systems school in the project was about $2.00 a square foot less than state aid allowance.

Cost data for projects built outside the California project should be analyzed most carefully to be certain similar conditions are being compared. Costs usually were found to be similar to non-systems schools using products of comparable quality, with a significant gain of environmental conditioning and flexibility in systems schools.

Reports of sharp increases of costs, in projects bid subsequent to the original California schools, were all checked as carefully as possible at the source; and in general, the problems were created by failure of the architects to understand the systems thoroughly enough to handle the bidding in a manner to guarantee competition, to use the strengths and remain within the limitations of the systems, and to orient general contractors thoroughly enough to eliminate fear of the unfamiliar.

Analysis indicates that schools built with SCSD components can be bought in Florida for not over the current average expenditures of the fourteen school districts which are now involved with the SSP staff.

Reduced Construction Time

In Georgia, an amazingly large gain in reduced construction time was realized. The designers utilized the inherent factors present in the systems to provide 54,000 square feet of engineering office space for Lockheed Aircraft at Marietta, Georgia in 88 calendar days after construction started, and 300,000 square feet of space in less than nine months. Later, the same architectural firm delivered for use, two twelve-classroom elementary schools, with central facilities for twenty-four classrooms, in just six months from the date the client called them.

The time savings in Georgia is by far the most impressive. Officials in Las Vegas claimed some savings and all of the architects who were contacted indicated a significant potential savings if a systems project is handled properly.

IV. RESPONSE IN FLORIDA

The SSP staff met twice, spending a full day each time, in twelve of the counties (Broward, Dade, Duval, Brevard, Palm Beach, Pinellas, Polk, Hillsborough, Orange, Volusia, Clay, Escambia) with school personnel, board members, architects, engineers, contractors, and others the school district wanted to invite. Only one meeting each was held in Sarasota County, Collier County, and at the University of West Florida.

The staff met twice with the Junior College Presidents Council, once each with the School Board Members-Superintendents group, the Florida Consulting Engineers Society, and the Florida Prestressed Concrete Association. A statewide seminar was held in November, 1965, and another in February, 1967, with over 1000 invitations distributed for each meeting and attendance of approximately 175. Personnel at schools of education, architecture and engineering at universities in the state were informed about the project. The Architect to the Board of Regents as well as the people in the State Development Commission were invited to participate.

Reaction from all groups usually followed a typical pattern of, first, a guarded interest, and later, enthusiastic support. Everyone had to learn enough about the concept and the resulting schools to see the gains possible and to be convinced that systems development will not lead to push button architecture and produce "stock plan" schools. Many architects expressed the thought that the building systems are additional tools to use in solving problems presented by education.

Architects, engineers and contractors were interested in the role they will play in a systems project. The SSP staff noted that responsibility, work, professional fees and contractor profits remain very much what they are in any other school building project.

An SCSD film was shown innumerable times, and to well over 1000 people, along with selections from the over 300 slides collected by the Florida SSP staff, of the buildings constructed with SCSD components. These audio-visual aids tell the story of SCSD as vividly as is possible without actual visitation to the schools. Principals, supervisors and other instructional personnel responded favorably to the schools, noting quality of the environment, flexibility of space, and the exciting programs of instruction.

Superintendents, junior college presidents, school board members and school plant planners were keenly interested in cost and the SSP staff encouraged them to consider any potential gains they could see in systems buildings over what they are now getting with conventional construction.

V. RESPONSE FROM INDUSTRY

The interest of industry in the program is quite high. Whereas the SCSD group was required to go to industry to promote interest, the SSP team has been sought out by industry. The team contacted approximately 100 manufacturers of national stature to let them know of the project and invite their response. Immediately, a significant number responded positively, indicating that the program will be quite competitive when underway. Daily, now, additional industrial groups contact the staff for information on how to participate in the program. Nationally, the total school market has increased at such a rate that industry will not ignore it when it is made accessible in a large volume project and through a central agency.

Past experience has been that schools were built of products principally developed for other purposes and adapted for use for educational construction. Interestingly, it now appears that school systems products work for industrial construction. Lockheed Aircraft, near Atlanta, has recently completed an engineering office building of 300,000 square feet constructed with SCSD systems. The Pullman-Standard Company also recently constructed a building using one of the systems developed for SCSD.

VI. RECOMMENDATIONS

Use of Existing Components for a Single School Project

The Florida SSP staff recommends that architects, and their school board clients, should consider the use of the component systems which were developed as a result of the California SCSD Project and are currently on the market, if they are seeking an educational environment of good quality, convenient and economical flexibility, and long term economy. If these gains are not important, and if the first cost of construction is of prime importance, a non-systems building can be built at a lower first cost.

The size of a single school type project is important to the first cost, as it is in any other type of school construction. The SCSD type systems will probably be competitive with any conventional construction on any project where good quality and flexibility are required, and size is not restricted. In general, school boards should try to avoid using the systems for small additions, for economic reasons. Where heavy equipment is necessary to the construction, the cost on small projects will inflate, and heavy equipment is necessary in building with SCSD components. A single school type project, for a complete elementary school of around a half million dollars or more, is as small as should be considered for a systems building.

Use of Existing Components for a Volume Buying Program

The Florida SSP staff recommends that a project be organized to combine the construction volume from junior colleges and other county school projects and that the SCSD type systems be bid, using the California performance specifications with minor modifications. This is shown as Program No. 1, on the Calendar on page 17. The purpose of this project is to gain the financial advantage possible in volume bidding. Construction which can be included would be those projects which will be bid during the 1967-68 fiscal year. The SSP staff will work with the educators and architects on projects which are included, and with industry to schedule delivery and installation of components. Industrial representatives have estimated a reduction of total project cost from five to ten percent if delivery can be scheduled so that production can be sustained at an even rate for a period of time.

If a project for volume bidding of existing systems (Project No. 1) is successful and there is sufficient interest from school districts, additional projects (Project No. 2 and Project No. 3) may be considered during fiscal years 1968-69 and 1969-70, or until new systems are developed to solve problems presented in Florida's performance specifications.

Bidding procedures should be similar to those used in California. Systems bids, taken for an estimated volume of work to be delivered according to a stated schedule, would establish prices for parts or increments of construction. These prices and the selected component systems details will then be issued to the school districts' architects for designing the individual schools. If bid prices are excessive, the project can be abandoned before any detailed drawings are made.

Bidding on performance specifications and a volume of work rather than typical architectural product specifications will insure greater competition than usual. Four steel structural systems along with companion components are now on the market to compete in bidding for the volume purchase program. Two were competitors in the California program. One was designed since California bids were taken, using "off the shelf" products and one is the result of modification of an existing system. The Florida Prestressed Concrete Association is now working to develop a concrete structural system using modified presently available products which can be bid in the first project. At least two products are on the market which solve the performance specifications in each of the component categories.

Pre-bidding part of the building and assigning these selected bidders as sub-contractors to the general contractor is nothing new to the building industry. The firm of Heery and Heery, Architects and Engineers in Atlanta and Athens, Georgia, have used this procedure in the Lockheed construction, and in at least two schools built in the State of Georgia, (each now completed) using the SCSD component systems.

New Product Development Program

Florida has many unique educational and architectural conditions requiring solutions different from those in California. The climate is more humid and hot than in the locale of the California SCSD project schools. Site conditions and hurricane winds must be considered. Educationally, conditions in Florida differ from those found in California five years ago. For example, team teaching programs involving as many as 150 learners in one large group are in operation in elementary schools in a significant number of school districts. Junior colleges are interested in joining the project and their educational requirements must be considered. An increasing number of electronic devices are available for use. The need for flexible utilities is increasing.

Experience of the concrete industry in California indicates that the individual concrete products producer cannot compete with the much larger and nationally or internationally oriented companies in supporting research and development to produce new products and systems. If concrete is to successfully compete for the structural systems market,

research and development must be supported by an association of companies. Representatives of the Portland Cement Association see a large potential market in Florida, Toronto, Canada, and elsewhere, and their officials have indicated interest in becoming a part of a Florida development project. The Florida Prestressed Concrete Association has indicated a similar interest. The purpose of the SSP program is to stimulate as much competition as possible, rather than restrict competition to a certain material or approach to solving a building problem.

SCSD systems provide a good one-story solution and a fair two-story solution, and nothing for additional stories. Some Florida school districts involved in the investigation want some three-story senior high schools, and most junior college campuses require some three-story construction. Several junior colleges are to plan central city campuses in the next five year period and are considering high rise construction and are talking of as many as eight stories. Florida SSP would definitely need a solution for single and multi-storied which would be gaining something not currently available.

All manufacturers who are supplying component systems for school construction indicate that they are constantly striving to improve the product and to become more competitive. In a Florida project, they would try to make further improvements in an attempt to stay ahead of the competition.

It is recommended that a research and development project (Program No. 4 on Calendar on page 17) be organized. Minimum size of the project is established by the producers of structural systems who apparently have the most extensive adjustments to make and most expensive research and development. Structural suppliers suggest a minimum construction market of $40,000,000.

Time Schedule of Research and Development Program

Program No. 4, is the last column of the Calendar on page 17. John Boice, Project Coordinator, and Vernon C. Bryant, Jr., Architect, with the SCSD project, discussed their experience at length with the Florida SSP staff. A total of six years will elapse from the beginning of the preparation of performance specifications until the last building will be completed in California. One of their most difficult problems was time scheduling, and because of this an untold number of schedules were developed and abandoned. The five years indicated in Program No. 4 was fixed, after numerous changes, with the thought that it would be the longest period which will be needed.

Caution is well taken that manufacturers should be given ample time to insure the maximum gain from their research and development. Also, the court in California warned that ample opportunity should be provided

in a project of this type to evaluate submissions and resubmissions of manufacturers. In the desire to speed the project the SCSD staff allowed time for only one submission and critique before bids were received.*

Architectural firms and the project staff in California warned of problems created by cutting time too drastically between selection of successful systems bidders and beginning of construction of the first buildings. Coordination is necessary to knit together the selected components, to produce a well integrated building system, and have the details of the results supplied to the designing architects in time for their use in preparation of working drawings. Problems should be solved as completely as possible before construction begins on the first school.

A minimum of $40,000,000 dictates a construction period of over two years in order to permit industry to plan production schedules to take economic advantage afforded by the large volume.

Legal Authority

Three separate sections of the Florida Statutes combine to provide ample legal authority for counties to join to organize a project. The first of these, Section 230.23 (4)(k) of the Florida Statutes provides authority for the cooperation of county boards with other county boards for joint projects as may be authorized.

Section 237.02(11) of the Florida Statutes authorizes county boards to expend funds for financing cooperative projects.

Section 229.79 of the Florida Statutes authorizes the State Department of Education to render special services to assist county boards in securing contractural needs at as reasonable prices as possible by providing a plan under which county boards may voluntarily pool their bids for such purchases.

The program could be operated in a manner similar to the school bus purchasing program. The State Superintendent of Schools could be the chief administrative official and the Department of Education under his supervision write specifications, receive bids and nominate successful bidders. Unit prices would be established and assigned to the counties as cost commitments which general contractors use in bidding individual schools.

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*Virginia Metal Products, Inc., versus First California Commission on School Construction Systems, Memorandum Decision No. 152646 of Superior Court of California, dated May 4, 1964.

CALENDAR

PROGRAM №1 VOLUME PURCHASE PROGRAM. EXISTING COMPONENTS.		PROGRAM №2 SAME AS PROGRAM NO.1		PROGRAM №3 SAME AS PROGRAM NO.2		PROGRAM №4 LONG TERM RESEARCH AND DEVELOPMENT PROGRAM SEEKING NEW SYSTEMS.	
SET SCOPE ISSUE PERF. SPECS.	JULY'67 AUG'67					START EDUC. SPECIFICATIONS START PERF. SPECIFICATIONS	JULY'67
REC'VE BIDS DETAILS TO ARCHITECTS						ISSUE PERF. SPECIFICATIONS	OCT'67
BEGIN COMPONENT DELIVERY	JAN'68					RECIEVE "INTENT TO BID"	DEC'67
FIRST SCHOOL COMPLETED	JUNE'68						
LAST SCHOOL COMPLETED	AUG'68		JULY'68 AUG'68				
			JAN'69			EVALUATE 1ST SUBMISSIONS	JAN'69
			JUNE'69			EVALUATE 2ND SUBMISSIONG	APR'69
			AUG'69		JULY'69 AUG'69	RECIEVE BIDS NOMINATE BIDDERS	JULY'69 AUG'69
						START MOCK-UP, TESTS, ETC.	OCT'69
					JAN'70		
						DETAILS TO ARCH'TS	FEB'70
					JUNE'70		
					AUG'70	FIRST SCHOOL TO BID	JULY'70
						LAST SCHOOL TO BID	JULY'71
						LAST SCHOOL COMPLETED	JULY'72

In the previously cited court decision, performance specifications were declared to be highly specific and properly the subject of competitive bidding on public projects. This decision also supported the selection of the lowest and best combined coordinated systems bid made up of compatible parts, although each of the parts may not be the lowest price in that particular category. One part of the system may be higher than a competitor but features of the part may make other parts lower in price.

Staff

The following staff is recommended for the project:

Project Educator
Project Architect
Staff Architect
Secretary

The staff of the California project included six architects and one educator. Consulting services were contracted as needed. Florida SSP staff believes that the smaller number of architects will be sufficient because of considerable precedent provided by the SCSD project, by increasing the time scheduled for systems development before bids are received and coordination of systems after component contracts are awarded, and generous provision for consulting services.

Financing

Annual and biennial budgets are on page 20. The staff recommends that administration cost of the five year research and development project (Project No. 4) be provided from funds other than construction budgets of the individual schools in the program. School districts in the program will contribute some expense for employees' time and travel in connection with the project. All school districts in the state may potentially benefit in future construction by use of the systems which are developed.

Funds for Florida's share of the administrative costs may come from two sources. The Superintendent may sponsor a bill to provide administrative funds necessary for the next biennium, or the funds could come from Capital Outlay and Debt Service money if a sufficient amount is made available. Legislators expressed an interest in a systems development project for Florida Schools during the last legislative session.(1965).

Administrative funds (for Florida's share) for the first phase (October, 1966 through June 30, 1967) were from County Capital Outlay and Debt Service Funds retained at the state level for administration. CO&DS funds retained at the current rate are not sufficient to support the cost of the biennial budget. If county superintendents approve, the Superintendent may recommend that the State Board of Education increase the rate of money retained to cover the cost. In this way the money would be deducted from funds already available.

The Board of Directors of EFL has approved a grant for half of the budget, providing the State of Florida matches the amount. Approval is for one year, with the understanding that it may be extended one year at a time if progress is satisfactory.

PROPOSED BUDGET

FLORIDA SCHOOLHOUSE SYSTEMS PROJECT

	Annual
SALARIES	$65,854.00
OTHER PERSONAL SERVICES	
Consultants' Fees	7,000.00
EXPENSE	
Travel	22,000.00
Space Rental	4,600.00
Office Operation	3,400.00
Graphic Materials Reproduction	1,000.00
Printing	2,000.00
Purchase of Publications	750.00
Purchase of Books	250.00
Purchase of Equipment	1,500.00

TOTAL	$108,354.00
Florida's Share	54,177.00
EFL's Share	54,177.00

VII. SUMMARY

1. SCSD in California is a success as adjudged after visitation of schools and analysis of the programs.

2. Response from educators and other interested factions in Florida to the SCSD program and resulting schools was definitely positive.

3. Response from industry to participation in a Florida research and development program indicates greater participation than that found in California, with perhaps twice as many industries involved.

4. Architects and their school board clients should consider use of the components developed for the SCSD project for any single school project.

5. A cooperative project with construction funded during the fiscal year 1967-68 should be organized to take advantage of volume bidding of existing systems (Project No. 1). If successful, other similar large projects should follow (Project No. 2 and Project No. 3) each fiscal year until systems are available from the SCHOOLHOUSE SYSTEMS PROJECT.

6. A project of at least $40,000,000 in construction costs should be organized, and a procedure similar to that used for SCSD followed, for the development of component building systems to solve the problems of school construction in Florida.

7. Projects using SCSD components and a Florida SSP should be organized and administered under the State Superintendent with the State Board of Education serving as the policy making body.

8. Cost of administration should be provided by the State of Florida and EFL for the long term program. Additional funds which may be needed for administration of the shorter programs could be provided by the school districts which join those programs.